Scenarios and Task Descriptions, Ideation, and Prototyping

Sept 30, 2016
Announcements

Milestone I is up

Due October 17 (changed from 14)

Midterm

October 19 (not changed)
Questions?
Randy Pausch’s Tips for Working in a Group

Meet people properly.
Find things you have in common.
Make meeting conditions good.
Let everyone talk.
Check your egos at the door.
Praise each other.

Put it in writing. Remember that “politics is when you have more than 2 people” – with that in mind, always CC (carbon copy) any piece of email within the group, or to me, to all members of the group. This rule should never be violated; don’t try to guess what your group mates might or might not want to hear about.

Be open and honest.
Avoid conflict at all costs.
Phrase alternatives as questions.
Overview of Today’s Lecture

Scenarios & HTA

Ideation
  why
  some tips

Prototyping
  why
  what to prototype
  methods
Task Descriptions

Task descriptions are structured and organized descriptions of existing or envisioned tasks of a system.

There are different flavours and they include:

- **Scenarios**
  - an informal narrative story, simple, ‘natural’, personal, not generalizable

- **Use Cases**
  - assume interaction with a system
  - assume detailed understanding of the interaction
  - similar to user stories concept from Agile development

- **Task Decompositions**
  - concrete, simple representations of a task to be done.
  - much more explicit and focused than scenarios

*The focus is on what people want to do, not the technology*
Plans specify alternatives for how a task might unfold

Cleaning a house decomposed into subtasks

0. To vacuum the house
1. get the vacuum cleaner out
2. put on the appropriate attachment
3. vacuum the rooms
   3.1 vacuum the hall
   3.2 vacuum the living rooms
   3.3 vacuum the bedrooms
4. empty the dust bag
5. put the vacuum cleaner and attachments away

Plan 0:
do 1-2-3-5 in that order
when the dust bag gets full do 4

Plan 3:
do any of 3.1, 3.2 or 3.3 in any order
depending on which rooms need cleaning
Task Analysis – Stopping Criteria

Take a task and break it into subtasks

0. In an emergency
1. read the alarms
2. work out the appropriate corrective action
3. perform corrective action

Could go indefinitely, so need to apply a stopping rule

When to stop depends on the aim of the system and the importance of the subtask

E.g., If aim is to install computer monitoring expand 1 and 3; If aim is to produce on-line manuals expand 2

A general rule is to stop dividing into subtasks when:

1. \[\text{Probability (P) of mistake in task} \times \text{Cost (C) of the mistake}] < \text{threshold}; \textbf{Or}

2. When reaches the level of basic operations (e.g., mouse movement)
Scenario-to-Task

• **Scenario 1:** George, a regular library visitor approaches Mary at the reference desk and asks if they have the Frankenstein comedy DVD. She asks if he means "Young Frankenstein" by Mel Brooks, and he say yes. She then directs him to the shelf where the DVD is expected to be. George retrieves his library card and brings it to the front desk. Mary checks out the DVD, but reminds George that he has $3.75 in unpaid fees. George says that he will pay the fees at a later date. Mary asks whether George would like a email or printed receipt. George says that email is fine and leaves with the DVD.

• **Discussion:** This task description contains many typical activities, which deal with vague requests about titles, the location of items in the library, as well as reminders about late fees. Most of these tasks are frequently done, and important.
Locating a DVD in a library

0. Locate a DVD:
   1. Go to the front desk
   2. Find the location of DVD on the shelves
      2.1 Access the search screen
      2.2 Enter the search criteria
      2.3 Identify the DVD requested
      2.4 Record the location of the movie
   3. Go to correct shelf to get the DVD
   4. Take the DVD to the front desk

Plan 0: do 3-4. If DVD isn’t on stacks do 1-2-3-4.

Plan 2: do 2.1-2.2-2.3-2.4.
Scenario-to-Task

Signing out a DVD

0. Sign out a DVD
   1. Enter library care information
   2. Decide to sign out video
      2.1 Check member’s overdue fee status
      2.2 Inform member of fees
      2.3 Accept to give out DVD
      2.4 Decline signing out DVD
   3. Get video information
   4. Sign out video
   5. Give receipt
      5.1 Give paper receipt
      5.2 Email receipt

Plan 0: do 1-2-3-4. If member not on file do 1-2-[Add member]-3-4
Plan 2: do 2.1-2.2-2.3. If member has a large number of late videos 2.1-2.2-2.4.
Plan 5: If member wants paper do 5.1, otherwise do 5.2.
Hierarchical Task Graph (HTG) for “Locate DVD”

Plan 0: do 3-4. If DVD isn’t on shelves do 1-2-3-4.

0. Locate DVD

1. Go to front desk
2. Find DVD on shelves
3. Go to stack to get DVD
4. Take DVD to front desk

Plan 2: do 2.1-2.2-2.3-2.4.

2.1. Access search screen
2.2. Enter search criteria
2.3. Identify requested DVD
2.4. Record location
Summary: Task Descriptions

Scenarios and task descriptions are a great way to solidify and formalize your understanding of your users’ needs and test cases.

You can use tasks and scenarios as tests against your ideas, prototypes, and systems.
Questions?
User Centered Design Process

- Investigate
- Produce
- Evaluate
- Ideate

Generate lots of ideas
Grasp issues and potential solutions

Fall 2016
COMP 3020
Ideation

How do we come up with great ideas?
How do we come up with lots of ideas?

How do we organize ideas?

Brief coverage in 3020, more in 4020
Inspiring creativity?

How can we inspire creativity?

Being aware of what works for you is VERY powerful knowledge
Creativity....

IDEO methods and friends...

Immerse yourself in the world you are designing for (gathering inspiration)
  Collect examples from existing systems
  Collect things that irritate you
  Collect things that seem really good
  Sample things that inspire you

Brainstorm in groups

Chat with others... (bounce ideas off of people)
Learn from existing systems
this isn’t plagiarism (but watch those patents 😊)

What’s so good about this? (Why is it good?)
What is the general problem that this solves?
Where else could I use it?

Practice articulating what makes something good.
Generate Ideas Constantly

Sketching
Enables you to think through ideas and variations, and convey design ideas to others early in the design phase.
What to do with your collection

Keep a sketchbook  Wallpaper it
Group brainstorming

keep the results of user research handy during the process (e.g. scenarios, lists of design requirements, etc.)

be visual
defer judgment
encourage wild ideas
build on others
go for quantity
one conversation at a time
stay focused on topic
Summary: Ideation

Find things that $x$ you
where $x = \{\text{inspire, interest, irritate, amuse}\}$

Find things that you $y$
where $y = \{\text{can improve, relate to}\}$

Break the rules, and think freely

Sketching is a great way to explore and ideate
Questions?
User Centered Design Process

1. Investigate
2. Produce
3. Evaluate
4. Ideate
5. Prototype

- Produce something tangible
- Identify challenges
- Uncover subtleties
What is a prototype?

In other design fields a prototype is a small-scale model:

- a miniature car
- a miniature building or town
What is a prototype?

In interaction design a prototype can be (among other things):

- a series of screen sketches
- a storyboard, i.e. a cartoon-like series of scenes
- a Powerpoint slide show, e.g., simulation
- a video simulating the use of a system
- a lump of wood (e.g. PalmPilot)
- a cardboard mock-up
- a piece of software with limited functionality written in the target language or in another language
From Buxton’s “Experience Design vs. Interaction Design”
OrangeX” Manual Juicer
OrangeX” Manual Juicer
Why Prototype?

Prototypes are useful for numerous purposes including:

- Promoting reflection (Schon 1983)
- Clarifying requirements
- Exploring alternatives
- Initial user testing
What to Prototype

Screen layouts and information display:
placement of different widgets, types of widgets, etc
  e.g. should edit fields come after/before control buttons

Work flow, task design:
the sequence of steps required to achieve the task
  e.g. flow from one screen to another, changes on the screen

Difficult, controversial, critical areas:
provide alternative solutions to be assessed
  e.g. business critical reports with specific alignment of fields

Technical issues:
  E.g., will the graphics rendered be fast enough?
Low-Fidelity Prototyping

Fidelity refers to level of detail
  High fidelity implies finished or detailed
  Low fidelity implies incomplete or lacking some detail

Why low-fidelity?
  Cheaper, faster to create
  Can explore multiple alternative design without getting stuck on technical details
  Users often more inclined to comment on designs that appear less “finished”
Phases of Prototyping

Early design
- Brainstorm different representations
- Choose a representation
- Sketch out interface style
- Task centered walkthrough and redesign
- Fine tune interface, screen design
- Heuristic evaluation and redesign
- Usability testing and redesign
- Limited field testing
- Alpha/Beta tests

Late design
- Low fidelity paper prototypes
- Medium-fidelity prototypes
- High-fidelity prototypes / restricted systems
- Working systems
Low-Fidelity Prototyping

How:

Paper-based sketches

Physical mock-ups using paper, cardboard
Sketching

Sketching is important to low-fidelity prototyping

Benefits:

Convenient

Doesn’t look finished

Can abstract away details

Don’t be inhibited about drawing ability.

Practice using and building your repertoire of simple symbols

Can also trace from images

If you have a tablet, you can store and re-use a set of frequently used elements
Paper Prototyping

Two common types:

- Index cards
- Storyboards
Index Cards

Index cards (3 X 5 inches)

Each card represents one screen

Often used in website development

As user “interacts” with the screen, the designer switches the card

Any missing/unclear functionality can be fixed on the spot
Paper + Video

https://www.youtube.com/watch?v=6TbyXq3XHSc

http://speckyboy.com/2010/06/24/10-effective-video-examples-of-paper-prototyping/
Storyboards

“comic book” approach, a series of keyframes as sketches—illustrates a sequence

originally from film; used to get the idea of a scene
snapshots of the interface at particular key points in the interaction
users can evaluate quickly the direction the interface is heading
use with your personas and tasks
Storyboards

1. Adam, Brian, and their mother enter the museum and go to the exhibit area where they decide to use the echoVue guide system.

2. The family moves to the table, where a guide is located. The guide informs the family regarding the narrative aspect of the guide system. The guide explains that they are time travelers from the future, and have been stranded in the present day due to their time machine malfunctioning. They are required to fix the time machine's data bank and...

3. The family is given instructions regarding the six devices that are available in the museum, which include: a collecting device, a listening device, a monitor device, a taxi device, and a divining rod device.

4. The family goes to the mission table where the two boys look at the table, where the family is told that they are a group of time travelers who came from the future, and who are now stuck in the present day because their time machine has malfunctioned. In order to repair the time machine, they must fix the time map.

5. The guide at the table asks the visitors if they can help repair the time map by first answering a few questions. These questions will ultimately help to understand the visitors' age, gender, and interests, used to create user models for the adaptive system. This phase provides the members the opportunity to become familiar with the operation of the devices.

6. The guide at the table asks the visitors if they can help repair the time map by first answering a few questions. These questions will ultimately help to understand the visitors' age, gender, and interests, used to create user models for the adaptive system. This phase provides the members the opportunity to become familiar with the operation of the devices.
Storyboards – Poor example

This is the main screen. The user can move songs back and forth from the Song List to the Play List. The time left on the tape is shown at the bottom.

![Tape Calculator](image_url)
Storyboards -- Better example

Even though the "poor example" above may superficially appear more polished because of the realistic screen shot, the example below is better because it shows the detailed steps needed to manipulate the interface.

<table>
<thead>
<tr>
<th>File</th>
<th>Song</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Song Pool</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:28 Little Green</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:51 California</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:05 River</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3:34 All I Want</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4:23 A Case of You</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2:52 This Flight Tonight</td>
<td></td>
</tr>
</tbody>
</table>

(1) This is the main screen after a file has been opened. The song title and duration of each song in the file appears in the Song Pool. The Time Used is initially zero, and the Remaining time shows the available time on the tape.
(2) The user wants to add a song to the Play List so she has clicked on the song "River" to select it.
(3) The user has clicked on the ">>" button to move the selected song to the Play List. The time used and time remaining are automatically computed and updated beneath the playlist.
(4) In a similar fashion the user has moved the song "California" to the Play List.
(5) Now the user has changed her mind and doesn't want "River" in the Play List. She selects "River" by clicking on it.

Now the user has changed her mind and doesn't want "River" in the Play List. She selects "River" by clicking on it.
(6) The user has clicked on the "<<<" button to return the selected song to the Song Pool. The time used and time remaining are automatically computed and updated beneath the playlist.
Tangible Prototypes
Low-Fidelity Prototyping

Some issues

Sometimes difficult to fake/simulate behaviour

Client (i.e., the person paying you) might be confused by the lack of programming

Can give a mistaken impression of how hard stuff is

User/client feedback might involve requests for things that are extremely difficult to implement (e.g., speech recognition)